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10/052,886

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EXAMINER

BELLO, AGUSTIN

ART UNIT

PAPER NUMBER

2633

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/052,886

Applicant(s)

CHOUDHARY ET AL.

Examiner

Agustin Bello

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-54 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/17/02</u> . | 6) <input type="checkbox"/> Other: ____.  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 12-19, 37-39, 41-43, 49-50, and 54 are rejected under 35 U.S.C. 102(b) as being anticipated by Bergano (U.S. Patent No. 5,111,322).

Regarding claims 12, 37, Bergano teaches generating a polarized signal based on receiver-side feedback (column 5 lines 38-44; input to reference numeral 408 in Figure 4); combining an ingress traffic signal with the polarized signal to generate a combined signal (reference numeral 402 in Figure 4); splitting the combined signal into a first split signal and second split signal (reference numeral 404 in Figure 4); detecting the first split signal; and detecting the second split signal (e.g. “means for recovering” in claim 2).

Regarding claims 13, 38, Bergano inherently teaches that the ingress traffic signal is compensated for polarization mode dispersion (see Figure 4).

Regarding claim 14, Bergano differs from the claimed invention in that Bergano fails to specifically teach that the polarization is circular. However, Bergano discloses that the polarization can be any type of polarization (column 3 lines 44-49), which inherently includes circular polarization.

Regarding claims 15, 41, Bergano teaches that the first split signal comprises a first component of the received signal (e.g. “Data 1” in Figure 4).

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Regarding claim 16, 42, Bergano teaches that the second split signal comprises a second component of the received signal (e.g. "Data 2" in Figure 4).

Regarding claims 17, 43, Bergano teaches that the ingress traffic is optical (inherent).

Regarding claim 18, Bergano teaches that the combined signal is split by a polarization beam splitter (reference numeral 404 in Figure 4).

Regarding claims 19, 49 Bergano inherently teaches that the polarization of a first component of the ingress traffic signal is aligned to an axis of the polarization beam splitter (inherently in that separation takes place).

Regarding claim 39, Bergano teaches that the signal is received by an automatic polarization controller (reference numeral 402 in Figure 4).

Regarding claim 50, Bergano inherently teaches that the detecting means is a photodiode (inherent in the detection of optical signals).

Regarding claim 54, Bergano teaches receiving an intensity modulated QPSK signal comprising orthogonal components, and decoding the QPSK signal (see Figure 4).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-10, 20-36, 40, 44-48, and 51-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bergano (U.S. Patent No. 5,111,322).

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Regarding claims 1, 20, 51, 53, Bergano teaches receiving a source signal (reference numeral 201 in Figure 2); splitting the source signal into a first split signal and second split signal (reference numeral 202 in Figure 2); modulating (reference numeral 205 in Figure 2) the first split signal based on a first dataset (reference numeral 207 in Figure 2) to generate a first modulated signal; shifting a phase of the second split signal (reference numeral 209 in Figure 2) to generate a phase-shifted second split signal; modulating (reference numeral 209 in Figure 2) second split signal based on a second dataset (reference numeral 208 in Figure 2) to generate a modulated second signal; controlling the polarization of the modulated second signal (reference numeral 214 in Figure 2); and combining the modulated first signal and the modulated second signal to generate a combined signal (reference numeral 210 in Figure 2). Bergano differs from the claimed invention in that Bergano fails to specifically teach that the second split signal is phase shifted prior to being phase modulated. Instead, Bergano teaches that the second split signal is first phase modulated, then phase shifted via a delay element (reference numeral 209 in Figure 2). However, one skilled in the art would clearly have recognized that it would have been possible to phase shift the second split signal prior to phase modulation without departing from the spirit or scope of the invention of Bergano. The arrangement of the phase shifter relative to the phase modulator would result not result in a significant difference in the product of the device of Bergano. One skilled in the art would have been motivated to phase shift the second split signal prior to phase modulation in order to delay the second split signal prior to phase modulation. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to phase shift the second split signal prior to phase modulation as claimed.

Regarding claims 2, 21, Bergano teaches that the polarization of the second signal is controlled to be orthogonal to the polarization of the modulated first signal (as seen by the polarization indicating arrows in Figure 2).

Regarding claims 3, 22, Bergano teaches that the phase shift is ninety degrees (column 3 lines 26-31).

Regarding claims 4, 23, Bergano teaches that immediately prior to combination, the polarization of the modulated first signal is transverse electric (TE) polarization, and the polarization of the polarized second signal is transverse magnetic (TM) polarization (as indicated by the orthogonal nature of the signals indicated by the polarization indicating arrows in Figure 2).

Regarding claims 5, 24, Bergano teaches that the modulation is phase modulation (by virtue of the use of MZ modulators reference numeral 205, 206 in Figure 2).

Regarding claim 6, 25, Bergano teaches modulating the source signal (column 3 lines 17-19).

Regarding claims 7-9, 26-29, Bergano teaches periodic modulation wherein the clock signal frequency and phase are synchronized with a data signal (inherent in the soliton mode-locked laser disclosed), but differs from the claimed invention in that Bergano fails to specifically teach that the modulated source signal is modulated via intensity modulation. However, intensity modulation is very well known in the art and would have been an obvious variation in the system of Bergano.

Regarding claims 10, 30, Bergano teaches that the signal is optical (inherent).

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Regarding claims 11, Bergano teaches modulating the combined signal (reference numeral 205, 206 in Figure 6).

Regarding claim 31, Bergano teaches that the source signal is a continuous wave laser (inherent).

Regarding claim 32, Bergano teaches splitting by a polarization beam splitter (reference numeral 202 in Figure 2) but fails to specifically teach that the source signal is circularly polarized. However, it is clear that the source signal could have been polarized in any of a variety of manners, including circular polarization.

Regarding claims 33 and 34, Bergano differs from the claimed invention in that Bergano fails to specifically teach that the source signal is split by a half-mirror or a 3dB splitter. However, both types of splitters are well known in the art and readily available. One skilled in the art would have been motivated to employ either one in order to meet a design requirement or to use what was available at the time. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ either a half-mirror or a 3dB splitter in the system of Bergano.

Regarding claim 35, Bergano differs from the claimed invention in that Bergano fails to specifically teach applying a DC voltage to the modulator. However, applying a DC voltage to a MZ modulator to induce a phase shift is well known in the art. One skilled in the art would have been motivated to do so in order to eliminate the need for Bergano's delay element (reference numeral 209 in Figure 2). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to applying a DC voltage to the MZ modulator of Bergano to induce a phase shift.

Regarding claim 36, Bergano differs from the claimed invention in that Bergano fails to specifically teach that a half-wave plate controls the polarization of the system. However, the use of half-wave plates to control polarization is well known in the art. One skilled in the art would have been motivated to use a half-wave plate control the polarization of the system since they are readily available and relatively inexpensive. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a half-wave plate as the polarization controllers of the system of Bergano.

Regarding claims 40, 45, Bergano differs from the claimed invention in that Bergano fails to specifically teach that the appropriate polarization of the signal is circular. However, it is clear that the signal could have been polarized in any of a variety of manners, including circular polarization.

Regarding claim 44, Bergano differs from the claimed invention in that Bergano fails to specifically teach that the local signal is provided by a continuous wave laser. However, the use of continuous wave lasers as local signals is well known in the art and would have been obvious to one skilled in the art at the time the invention was made.

Regarding claim 46, Bergano differs from the claimed invention in that Bergano fails to specifically teach that a quarter-wave plate controls the polarization of the system. However, the use of quarter-wave plates to control polarization is well known in the art. One skilled in the art would have been motivated to use a quarter-wave plate control the polarization of the system since they are readily available and relatively inexpensive. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ a quarter-wave plate as the polarization controllers of the system of Bergano.



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Regarding claims 47-48, Bergano differs from the claimed invention in that Bergano fails to specifically teach that the combiner is a half-mirror or a 3dB splitter. However, both types of combiners are well known in the art and readily available. One skilled in the art would have been motivated to employ wither one in order to meet a design requirement or to use what was available at the time. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to employ either a half-mirror or a 3dB splitter in the system of Bergano.

Claim 52 recites a combination of individually rejected elements and is therefore rejected on the same grounds as stated above.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Griffin discloses relevant art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Agustin Bello  
Examiner  
Art Unit 2633

A handwritten signature in black ink, appearing to read 'A. Bello', written in a cursive style.

AB